EFFICIENT SUPPORT OF CONSISTENT CYCLIC SEARCH

WITH READ-COPY-UPDATE

ABSTRACT

A method, system and computer program product for modifying data elements in a

5   shared data element group that must be updated atomically for the benefit of readers requiring

group integrity. A global generation number is associated with the data element group and

each member receives a copy of this number when it is created. Each time an update is

performed, the global generation number is incremented and the updated element's copy of

this number is set to the same value. For each updated data element, a link is maintained from

10   the new version to the pre-update version thereof, either directly or using pointer-forwarding

entities. When a search is initiated, the current global generation number is referenced at the

commencement of the search. As data elements in the group are traversed, the reader

traverses the links between new and old data element versions to find a version having a

matching generation number, if any. Following the occurrence of a grace period in which all

15   readers have passed through quiescent states, all old data element versions are freed.